

ABSTRACT OF THE DISCLOSURE

An electron beam applied from an electron gun 1 and reflected off a surface of a specimen 7 placed on a stage 2 that is tilted at a tilt angle $\phi=0$ is detected, and a
5 signal intensity thereof is measured by an electron detector 3. Based upon the measurement, an image processing unit 6 calculates a slope angle θ of the surface of the specimen, and determines candidates for cross-sectional shape of the specimen. Signal intensity of the electromagnetic wave that would be reflected from a surface having a cross-sectional shape of each of the candidates if the tilt angle ϕ were
10 changed into $\phi=\phi_0$ are estimated, and compared with a signal intensity actually measured by the electron detector 3 with the tilt angle ϕ being changed into $\phi=\phi_0$. Consequently, cross sectional shape and three-dimensional shape can be determined based upon a result of comparison, without utilizing a matching process of feature points.